

NOTES ON SOME SPECIES OF CERAMBYCIDÆ
(COL.) FROM THE SOUTHERN PORTION
OF VANCOUVER ISLAND, B. C.

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The following notes are the results of the authors' joint and separate observations and investigations carried out during the years 1924 and 1925; these have special reference to the host trees of the various species dealt with and to other matters connected with the life histories of such species. No host trees are included, of whose use as such the authors have not obtained indisputable proof at first hand. While it is not contended that the following information is in any way new, it is hoped that it may be of interest to other workers in this group as corroborative evidence if nothing more.

The authors wish to take this opportunity of recording their sincere appreciation of the unfailing assistance, encouragement and stimulation which they have received from Dr. E. C. Van Dyke, to whom must be given primary credit for any information of value which may be contained in the following notes.

ERGATES SPICULATUS Lec.

This species has been found evidently newly emerged under a new railroad tie of douglas fir (*Pseudotsuga mucronata* Raf.).

The tie in question was extensively tunneled, heaps of ejected frass being piled on the ground beneath the cut made in sawing.

OPISMUS QUADRILINEATUS Mann.

Dead specimens and remains have been found at various times at the elliptical burrow exits beneath the bark of dead balsam (*Abies grandis* Lindl.) and dead douglas fir (*Pseudotsuga mucronata* Raf.). More extensive evidence as to the life history of the species was obtained in late December, 1925, when a series of living imagines was obtained from pupal cells in dead balsam.

The larva tunnels in the heartwood at from one-half inch to two or more inches from the surface, the borings as a rule following the grain of the wood. When ready to pupate a perpendicular tunnel about three inches in length is bored out and a horizontal exit burrow is constructed to the inner surface of,

and sometimes partly into, this bark; this tunnel is stuffed with frass. Pupation takes place at the top of the perpendicular tunnel, which is slightly enlarged so as to form a pupal cell.

The imagines emerge from the pupal stage in the latter part of December, remaining in the wood until spring. Very freshly emerged specimens are distinctly sluggish, but those that have fully completed their metamorphosis hurriedly seek refuge down their perpendicular burrows when disturbed. It seems that the perpendicular burrow is cleared of débris by the imago, as these burrows were only clear in the cases where the imagines had evidently emerged some time before, and were full of refuse in the cases of those whose metamorphosis was hardly complete.

RHAGIUM LINEATUM Oliv.

Has been obtained in series from beneath the bark of dead balsams (*Abies grandis* Lindl.).

The larvæ work in the cambium and outer sapwood. Pupation takes place at the end of July and beginning of August in the larva's second summer. When the bark is removed from the trunk, the pupal cell appears as an oval, about twice as long as wide, outlined with frass, the length being determined by the length of the pupa. The depth of the cell which seems to be obtained by gnawing away the inner surface of the bark is only sufficient to enable the pupa to fit snugly between the bark and the wood. Pupation is not usually of more than a month's duration.

On emergence from the pupal stage in late August or early September, the imago commences to gnaw its way through the bark from the head of the pupal cell. It should be stated that the pupa has invariably been found with the dorsal portion against the wood and the ventral against the bark, which position is retained by the imago in gnawing its way out. The imago gnaws upward and outward, forming a conical-shaped chamber in the bark at the head of the pupal cell, in which it hibernates; it finally emerges from the tree in late March or early April, April and May being the months of adult activity in this locality.

XESTOLEPTURA CRASSIPES (Lec.)

Remains have been found at the burrow exit beneath the bark of an old stump of the balsam (*Abies grandis* Lindl.).

The larvæ mine deep within the heartwood, pupating near the surface, exit burrows to the inner surface of the bark having been bored prior to pupation.

The adults are attracted to flowers, but are more frequently found flying amongst low herbage.

LEPTURA DOLOROSA Lec.

A dead specimen was found at the burrow exit beneath the bark of an old stump of douglas fir (*Pseudotsuga mucronata* Raf.).

The adults are most frequently taken in flight, but are also found frequenting the flowers of *Spiræa discolor* Pursh and sunning themselves on large leaves such as those of *Acer macrophyllum* Pursh.

ULOCHÆTES LEONINUS Lec.

Only one tree was found in which the species was present, and that was a dead balsam (*Abies grandis* Lindl.). The portion of the trunk from three to fifteen feet from the ground was literally honeycombed with the larval borings of this species to a depth of some three inches into the heartwood.

The larva prior to pupation bores for some distance perpendicularly, it then turns at a right angle and bores horizontally out to the inner surface of the bark. This done it returns to the angle where the pupal cell is formed, the horizontal boring being blocked with shredded wood, etc., on the return journey. The imago on emergence has its exit ready made, with the exception of the bark through which it has to make its way. July is the month of adult activity.

This interesting insect in many ways bears a striking resemblance to a bumblebee, its appearance and coloration are similar, it has the same kind of blundering flight; the female when handled makes a bluff at stinging with the ovipositor and also emits a bee-like, albeit somewhat faint, buzzing sound. It was not definitely ascertained how the buzzing was produced, though it is believed to have been done by vibrating the wings against the elytra, or possibly through the spiracles as is the case with the Syrphidæ, wings and elytra alike being held at an angle of 45 from the abdomen during the performance.

The ♀ in flight, and sometimes when at rest, carries the ovi-

positor and tip of the abdomen curved up over the back, the ovipositor pointing straight to the front.

NECYDALIS LÆVICOLLIS Lec.

This species has been found breeding in willow and alder (*Alnus rubra* Bong.). The borings, pupal cells, etc., though on a smaller scale, are similar in plan to those of the preceding species, the larvæ riddling the heartwood with perpendicular burrows. July and August appear to be the months of adult activity.

One of the most interesting points observed in connection with this species was the heavy mortality which occurs between emergence from the pupa and exit from the host tree. Some casualties were noticed amongst the willow borers, but they were far more frequent in the cases where alder was the host tree. Counting corpses and borings from which successful emergence had taken place, casualties in alder ranged from 15 per cent or 20 per cent to as high as 75 per cent. From the observations made it would appear that the comparative hardness of wood and bark may have direct bearing on this subject, for the harder the wood was the heavier was the casualty list.

This peculiar beetle is liable to be overlooked on account of its likeness to certain of the parasitic Hymenoptera.

SEMANOTUS LIGNEUS Fab.

This species has been found breeding in the giant cedar (*Thuja plicata* Don). The eggs are laid in crevices of the bark singly or in groups of six to twelve. On hatching, the larvæ at once diverge from each other; the burrows are fairly straight at first, but soon twist and turn, most commonly looping back and forth across the grain of the wood. When full fed the larva dips into the wood, where it forms an elongate pupal cell, parallel to the grain in most cases; it then turns, and retracing its course, bores nearly through the bark, and on finally retreating to the cell fills the exit burrow with frass; pupation is of short duration, taking place in the late summer. On emergence the adult remains over winter in the pupal cell where it is found lying ventral surface uppermost, head toward exit burrow. Pupæ were seen up to the end of August; from then on only adults could be found.

A log which had been stripped of bark in late August was

found on re-examination to have many empty pupal cells, from which the adults had voluntarily emerged, possibly due to the more direct warmth from the sun's rays arousing them to premature activity.

A hymenopterous parasite, *Xorides insulans* Cresson, has attacked this species to a large extent the past season. Judging by the number of parasitic cocoons at the end of the larval burrows in the sapwood, it effects its deadly work before its prey has entered the heartwood for pupation. There is no doubt that the parasite is a most useful check to what otherwise might prove a serious pest.

PHYMATODES DECUSSATUS Lec.

PHYMATODES DECUSSATUS var. OBLIQUUS Csy.

This species and its variety have been found working in dead branches and saplings of garry oak (*Quercus garryana* Dougl.).

A superficial examination shows a number of small elliptical holes in the bark, through which the adults have emerged. A more detailed investigation discloses the fact that the larvæ feed in the sapwood, where they execute winding and tortuous galleries, often so extensive as to completely loosen the bark. When full fed the larva dips abruptly into the heartwood, where it forms an elongate pupal cell, parallel with the grain. Prior to pupation it re-emerges from the cell and continues the exit burrow almost to the outer surface of the bark, which burrow it blocks with frass.

Occasionally a pupal cell is found having two burrows emerging from it, one for ingress the other for egress, a very different arrangement from that above described.

Further investigations may show that one type of cell, etc., is the work of the species, the other type that of the variety. Should this prove to be the case it will tend to show that the variety is a good species.

This species is frequently found in association with *Neoclytus conjunctus* Lec.

PHYMATODES VULNERATUS Lec.

This species has been found breeding in maple (*Acer macrophyllum* Pursh). The habits of the larvæ appear to be similar to those of the larvæ of the species mentioned above. No pupal

cells have been noted with more than one burrow leading into them.

XYLOTRECHUS UNDULATUS (Say)

A dead specimen of this species has been found at the burrow exit under the bark of a dead balsam (*Abies grandis* Lindl.). It is expected, however, that this will be found to be the exception rather than the rule, as the observed habits of the imagines lead one to believe that the douglas fir (*Pseudotsuga mucronata* Raf.) will prove to be the host tree most commonly utilized. We have not, however, as yet obtained indisputable proof of the douglas fir being so used.

NEOCLYTUS CONJUNCTUS Lec.

Dead imagines were taken from under the bark of an oak log in September; for some reason, possibly the prolonged drouth of this year, the bark was dried to such an extent that the insects were unable to gnaw their way through, a factor which seems to be of some importance in the economy of other Cerambycidæ of similar habits, judging from our observations this season. In the present case it was estimated that 3 per cent of the "guests" in this particular log failed to emerge, perhaps from this cause.

From observations carried out it is found that the larvæ feed in the heartwood of the dead branches or trunks, where they execute extensive galleries, to a degree that they are instrumental in causing many branches to fall. Several instances were noted in recently fallen branches that could be assigned to no other cause.

The pupal cell is constructed parallel to the grain and about half to three-quarters of an inch below the surface of the wood; the larva eats an exit burrow from the cell to nearly through the bark, afterward filling it with fine particles of frass. Perfect living adults were dug out of these cells during the middle of November. They were lying in their cells, elytra uppermost, head toward exit, and were very sluggish on removal. The normal period of "adult" activity is April and May; they therefore appear to assume the adult form in early winter, remaining quiescent until spring in the pupal cell.

PLECTURA SPINICAUDA Mann.

This spider-like wingless Cerambycid has been found breeding in maple (*Acer glabrum* Torr and *Acer macrophyllum*

Pursh.), alder (*Alnus rubra* Bong and *Alnus sitchensis* Regel), and willow.

The larvæ make winding galleries in the sapwood, filled with coarse frass; when approaching maturity they dip into the heartwood and form oval cells just below the surface.

The adult on emergence gnaws its way through to the exterior. Some adults emerge in the fall, being taken at large in September and October, and all adults taken from pupal cells during this period were either dead or in process of gnawing their way to freedom. Throughout the winter, larvæ in all stages were found working and pupæ and imagines in the pupal cells, the majority of the latter dead. Adults have also been taken at large in April and May, the months hitherto considered to be the normal period of activity.

The above recorded habits of this most interesting insect lead one to believe that the species may be in a state of evolution or process of adaption to a changed condition of climate. Possibly the species is of boreal origin, where a longer period of development would be required than would be necessary under the warmer climatic conditions pertaining here; perhaps these conditions are causing this species to gradually assume habits similar to those of the closely allied *Ipochus fasciatus* Lec. of southern California.

SYNAPHÆTA GUEXI Lec.

In one case investigated a dead adult was obtained lying in the pupal cell in the heartwood of a willow log; where several well-grown larvæ were observed, the latter were mining in the sapwood, forming long galleries packed loosely with coarse frass. From the structure of the pupal cell it was evident that the larva dipped into the heartwood for a short distance and formed an elongate pupal cell parallel to the grain. The larvæ then filled the ingress burrow with shredded wood, pupating head directed toward it, suggesting that this burrow is also used as the exit by the imago.

Larvæ were in various stages of growth, suggesting a wide range in period of emergence, a conjecture which is borne out by consulting a list of dates of captures which extend from April to October. June and July would appear to be the average time of adult activity.